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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/405,848	09/27/1999	TOSHIO NORITA	48864-021	9972

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EXAMINER

AGGARWAL, YOGESH K

ART UNIT	PAPER NUMBER
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2615

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/405,848	NORITA ET AL.	
	Examiner	Art Unit	
	Yogesh K. Aggarwal	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-15 and 24-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15 is/are allowed.
- 6) ☒ Claim(s) 11-14, 24-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Arguments

1. Applicant's arguments filed 05/26/2005 have been fully considered but they are not persuasive.

Examiner's response:

2. Applicant argues w.r.t claim 11 that Suzuki et al. fails to disclose or suggest a structure for obtaining plural signals having different (electric charge) accumulation times to select a non-saturated signal appropriately from the plural signals in order to acquire a certain answer. Suzuki is silent about a controller. The Examiner respectfully disagrees. Suzuki teaches a controller (drive circuit 7) which controls the electric charge accumulation time of the photoelectric element arrays Sa and Sb such that three different types of outputs with different electric charge accumulation times can be generated (T1, T2 and T3) and T2 which is a region of unsaturation can be selected out of three outputs (col. 4 lines 11-22, figure 6). Therefore Suzuki teaches as shown in figure 6 a characteristic of the photoelectric element arrays Sa and Sb, having different charge accumulation times and T2, which is a region of unsaturation, can be selected out of three outputs. A controller (drive circuit 7) drives the photoelectric elements (col. 3 line 66-col. 4 line 4) and therefore reads on the claimed limitation "a controller for controlling the electric charge accumulation time of said plurality of light-receiving elements such that a plurality of types of outputs with different electric charge accumulation times are produced by each of said light-receiving elements, and selecting non-saturated signals among said plurality of types of output signals".

3. Applicant further argues regarding the newly added limitation "...plurality of light-receiving elements such that a plurality of types of outputs with different electric charge

Art Unit: 2615

accumulation times are produced by each of said light-receiving elements". Examiner notes that Suzuki reference teaches the characteristic lines 12a, 12b, 12c correspond to photoelectric element arrays Sa and Sb (col. 4 lines 11-15). Suzuki further teaches and as shown in FIG. 4, the photoelectric element array Sa is composed of small photoelectric elements m.sub.a through m.sub.n arranged in a row, and similarly the photoelectric element array Sb contains small photoelectric elements m.sub.a through m.sub.n arranged in a row (col. 3 lines 40-44). Therefore photoelectric element arrays Sa and Sb (plurality of light-receiving elements) generate a plurality of types of outputs with different electric charge accumulation times produced by each of said light-receiving elements (characteristic lines 12a, 12b, 12c correspond to different charge accumulation time T1, T2 and T3). If the whole array generates different accumulation time, then each photoelectric will generate a plurality of outputs too. Thus Suzuki teaches the amended claim.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 11 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art in view of Suzuki et al. (US Patent # 4,621,191).

[Claim 11]

Applicant's own admitted prior art teaches a three-dimensional input apparatus comprising a projector for irradiating a detection light beam on an object (Page 1 lines 26-30), a scanning

Art Unit: 2615

mechanism for scanning said object by deflecting the direction of irradiation of said detection light beam (Page 2 lines 1-19), an image sensing device with an image sensing surface including a plurality of two-dimensionally arranged light-receiving elements, for receiving the detection light beam reflected on said object (Page 3 lines 15-18).

Applicant's admitted prior art fails to teach a controller for controlling the electric charge accumulation time of plurality of said light-receiving elements such that a plurality of types of outputs with different electric charge accumulation times are produced by each of said light receiving elements, and selecting said non-saturated signals among said plurality of types of output signals.

However Suzuki teaches a controller (drive circuit 7) which controls the electric charge accumulation time of the photoelectric element arrays S_a and S_b (plurality of light receiving elements) such that three different types of outputs with different electric charge accumulation times can be generated (T1, T2 and T3) and T2 which is a region of unsaturation can be selected out of three outputs (col. 4 lines 11-22, figure 6) in order to increase the dynamic range.

[Suzuki reference teaches the characteristic lines 12a, 12b, 12c correspond to photoelectric element arrays S_a and S_b (col. 4 lines 11-15). Suzuki further teaches and as shown in FIG. 4, the photoelectric element array S_a is composed of small photoelectric elements m.sub.a through m.sub.n arranged in a row, and similarly the photoelectric element array S_b contains small photoelectric elements m.sub.a through m.sub.n arranged in a row (col. 3 lines 40-44). Therefore photoelectric element arrays S_a and S_b (plurality of light-receiving elements) generate a plurality of types of outputs with different electric charge accumulation times produced by each of said light-receiving elements (characteristic lines 12a, 12b, 12c correspond

Art Unit: 2615

to different charge accumulation time T1, T2 and T3). If the whole array generates different accumulation time, then each photoelectric will generate a plurality of outputs too. Thus Suzuki teaches the amended claim].

Therefore taking the combined teachings of Applicant's admitted prior art and Suzuki, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have a controller for controlling the electric charge accumulation time of said light-receiving elements such that a plurality of types of outputs with different electric charge accumulation times are produced by said light receiving elements, and selecting said non-saturated signals among said plurality of types of output signals in order to increase the dynamic range as compared to T1.

[Claim 24]

This is a method claim corresponding to apparatus claim 11. Therefore it has been analyzed and rejected based upon the apparatus claim 11.

6. Claims 12 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art in view of Suzuki et al. (US Patent # 4,621,191) as applied to claim 11 above in further view of Kazama et al. (US Patent # 5,883,668).

[Claim 12]

Applicant's admitted prior art in view of Suzuki fail to teach "wherein said controller controls said image sensing device so as to output a signal corresponding to the accumulated electric charge upon lapse of a first accumulation time and continue to accumulate electric charge while maintaining said accumulated electric charge until a second charge accumulation time".

However Kazama et al. teaches a non-destructive readout technique in which there is a mix of

Art Unit: 2615

pixels that were read before the update and pixels that were not read before the update which means the former pixels have underwent the reset operation and that the latter pixels have accumulated charge for a long period of time without undergoing the reset operation (col. 9 lines 23-37) and is read as outputting a signal corresponding to the accumulated electric charge upon lapse of a first accumulation time and continue to accumulate electric charge while maintaining said accumulated electric charge until a second charge accumulation time. Therefore taking the combined teachings of Applicant's admitted prior art, Suzuki and Kazama, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have a controller that controls said image sensing device so as to output a signal corresponding to the accumulated electric charge upon lapse of a first accumulation time and continue to accumulate electric charge while maintaining said accumulated electric charge until a second charge accumulation time. The benefit of doing so would be so that a non-destructive readout operation can be performed in which only the pixels from which signals have been read are reset to drain accumulated charge as taught in Kazama (col. 9 lines 25-28).

[Claim 25]

This is a method claim corresponding to apparatus claim 12. Therefore it has been analyzed and rejected based upon the apparatus claim 12.

7. Claims 13 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art, Suzuki et al. (US Patent # 4,621,191), Kazama et al. (US Patent # 5,883,668) as applied to claim 12 above in further view of Kusaka et al. (US Patent # 5,589,909).

[Claim 13]

Art Unit: 2615

Applicant's admitted prior art, Suzuki and Kazama fail to teach, "wherein said controller selects among said non-saturated signals one having a long electric charge accumulation time".

However Kusaka et al. teaches that if the intensity of the target object is low (read as non-saturated signals) then signals with long charge accumulation are selected (col. 10 lines 57-67).

Therefore taking the combined teachings of Applicant's admitted prior art, Suzuki Kazama and Kusaka, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have a controller that selects among said non-saturated signals one having a long electric charge accumulation time. The benefit of doing so would be so that conditions related to the intensity of light from the target object to be photographed can also be detected as taught in Kusaka (col. 10 lines 60-62).

[Claim 26]

This is a method claim corresponding to apparatus claim 13. Therefore it has been analyzed and rejected based upon the apparatus claim 13.

8. Claims 14 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art in view of Suzuki et al. (US Patent # 4,621,191) as applied to claim 11 above in further view of Kusaka et al. (US Patent # 5,589,909).

[Claim 14]

Applicant's admitted prior art in view of Suzuki fail to teach, "wherein said controller selects among said non-saturated signals one having a long electric charge accumulation time".

However Kusaka et al. teaches that if the intensity of the target object is low (read as non-saturated signals) then signals with long charge accumulation are selected (col. 10 lines 57-67).

Therefore taking the combined teachings of Applicant's admitted prior art, Suzuki and Kusaka, it

Art Unit: 2615

would have been obvious to one skilled in the art at the time of the invention to have been motivated to have a controller that selects among said non-saturated signals one having a long electric charge accumulation time. The benefit of doing so would be so that conditions related to the intensity of light from the target object to be photographed can also be detected as taught in Kusaka (col. 10 lines 60-62).

[Claim 27]

This is a method claim corresponding to apparatus claim 14. Therefore it has been analyzed and rejected based upon the apparatus claim 11.

Allowable Subject Matter

9. Claim 15 is allowed.

10. The following is a statement of reasons for the indication of allowable subject matter:

The prior art fails to suggest or teach a controller for controlling said image sensing device so as to output a first signal due to a first electric charge accumulation time and a second signal due to a second electric charge accumulation time equal to a predetermined multiple of said first signal during the electric charge accumulation of said image sensing device; and a selecting circuit for selecting said second signal in the case where said second signal has not been saturated and using selecting a signal of a size equal to said predetermined multiple of said first signal in the case where said second signal has been saturated; and a processor for performing calculations using the selected signal, said selecting circuit including: a first switch, a second switch, a memory, a comparator and an integrator wherein said first switch receives the first and second signals outputs the first signal to the memory and outputs the second signal to the second switch and to

Art Unit: 2615

the comparator, the integrator receives the first signal from the memory and outputs the signal of a size equal to said predetermined multiple of said first signal to the second switch, and the comparator compares the second signal to a reference saturation level and outputs a control signal to the second switch to output the second signal where the second signal has not been saturated and to output the signal of a size equal to said predetermined multiple where the second signal has been saturated.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yogesh K. Aggarwal whose telephone number is (571) 272-7360. The examiner can normally be reached on M-F 9:00AM-5:30PM.

Art Unit: 2615

12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571)-272-7593. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

13. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

YKA
August 3, 2005



DAVID L. OMETZ
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EXAMINER